

## NOTES

IN the second report of the Royal Sanitary Commission, just published, the Commissioners appear to be under the impression that no branch of science other than that of medicine is to any great extent involved in sanitary questions, and therefore recommend that the 4,000 medical men appointed under the Poor-law Board should be the inspectors under the proposed new sanitary department; mentioning, however, the probability of a variety of officers being requisite for scientific purposes only. We think that, in order to carry out sanitary reform efficiently, the new department should have the means of consulting the highest authorities in most of the branches of physical science, and here, as in many other cases, we see the necessity for a Board of Science, whose duty it should be to advise the Government on all scientific questions.

WE regret to state that the work at the new buildings at Burlington House for the learned societies has come to a standstill, owing, we are informed, to the failure of the contractors.

OUR Paris correspondent reports the death, at the age of 80, of M. Becquerel, the celebrated electrician. He died in Normandy during the siege of Paris.

THE series of afternoon scientific lectures to be delivered in the Lecture Theatre of the Royal Dublin Society is as follows:—March 25—G. J. Stoney, A.M., on the Sun. April 1—Professor Traquair, M.D., on the Vertebrates of the Coal Period. April 8—Dr. C. Cameron, on the Source of Muscular Force. April 15—Professor J. R. Greene, on the Phenomena of Sleep and Dreams. April 22—Professor W. T. Dyer, on Recent Additions to our Knowledge of Fossil Plants. April 29—Professor T. Andrews, F.R.S., on the Continuity of Liquid and Gaseous States of Matter. May 6—Professor P. Redfern, M.D., Illustrations of the Advance of Physiology. May 13, Dr. J. E. Reynolds, on the Chemistry of Milk, and a new mode of testing its quality.

WE are glad to hear that the Hackney Scientific Association is in an active and prosperous condition. In another column we print a very short abstract of a paper read at a recent meeting on the fossil remains of mammalia found in the Lea Valley.

THE *Moniteur Scientifique*, edited by Dr. Quesneville, is the only scientific paper which continued to be published in Paris regularly throughout the siege. Since the 1st of October its circulation has been necessarily confined to its subscribers in Paris; but we have now received a parcel of ten of its fortnightly numbers, and heartily commend it to the notice of men of science in England.

THE following is the substance of a communication on the periodicity and heliographic distribution of sun-spots, addressed by M. Zöllner to the *Astronomische Nachrichten* on March 2nd:—The sun-spots are slaglike by the radiation of heat on the glowing and liquid surface of the sun; the products of the cooling having again dissolved, in consequence of the disturbance of equilibrium produced by themselves in the atmosphere. When these disturbances are not only local, but generally distributed, the formation of new spots is but little favoured at the times of such general motion of the atmosphere, because then the most essential conditions of the surface are wanting for a severe depression of temperature by radiation, namely, the rest and clearness of the atmosphere. But when the surface has again gradually become quiet after the dissolution of the spots, the process again recommences, and acquires in this manner a *periodic* character, in consequence of the mean relationships of the surface of the sun, which may be considered as attaining an average in long periods. The distribution of the spots in area must, according to this theory, be determined by

the zones of greatest atmospheric clearness, which, as has been shown, generally coincide with the zones of the greatest abundance of spots.

THE following are our American notes for the week, for which we are again indebted to *Harper's Weekly*:—The eighty-fifth number of the Proceedings of the American Philosophical Society, lately published, and completing the eleventh volume, is, like many of its predecessors, nearly filled with important communications from Professor Cope, whose industry in publishing accounts of new, recent, and extinct zoological forms is untiring. One of the most important of these communications is an article upon certain fresh-water tertiary fishes from Idaho, collected by Mr. Clarence King, and embracing twelve species of six genera. These all belong to the Cyprinidæ, with the exception of one species of the trout family. With these fish were three species of *Astacus*, also described by Professor Cope in another communication.—We have already referred to one of the papers of Professor Cope, in which he describes a new species of mosasauroid, called *Liodon dyspelor*, based upon specimens from New Mexico in the museum of the Smithsonian Institution, and which, according to Professor Cope, probably exceeded one hundred feet in length, and may be considered as the longest reptile of which we have any account.—We have frequently called attention to the interest and value of the dredging operations conducted by Count Pourtales in behalf of the coast survey, in the deep seas adjoining the southern coast of the United States. The results of these labours are being published by the Museum of Comparative Zoology at Cambridge, Massachusetts; and there has just appeared an elaborate memoir upon the crustaceans by Dr. William Stimpson, of Chicago. A large number of new genera and species were detected in the collection, and a portion of these are enumerated in the report referred to, which embraces only the Brachyura, the remaining families being reserved for a future memoir.—The Commissioners of Fisheries for the State of New York have lately announced in the public papers their readiness to furnish, free of expense, living black bass, cat-fish, white bass, rock bass, roach, perch, sunfish, and pike-perch, for stocking the waters in any part of the State of New York, provided parties desiring them will send an agent to receive and take charge of them. All of these are now bred at the State establishment at Caledonia, and applications for them are to be made to Seth Green, Rochester.—One result of the completion of the Pacific Railroad has been the introduction into Eastern markets of Western game. We see it stated that two hundred antelope were sent to Boston during a single week, and three hundred saddles of deer, of both the white-tailed and black-tailed species. The antelope brought from fifteen to twenty cents per pound wholesale, and the venison from twenty to twenty-five.

THE first annual report of the Association for the Improvement of Geometrical Teaching has just been issued. Gentlemen who may desire to have a copy of the same, or to receive information on matters connected with the Association, will perhaps be glad to know the names of the local London secretaries, who are Mr. C. W. Merrifield, F.R.S., Royal School of Naval Architecture, South Kensington, and Mr. R. Tucker, M.A., University College School, W.C.

THE Proceedings of the Royal Asiatic Society of Bengal for January contains a drawing of a remarkable case of polydactylism in a horse from Bagdad. Mr. Wood-Mason, who exhibited the specimen, remarked that the splint-like rudiments of the metacarpals of the fourth toe on each fore foot had given rise to a supernumerary digit provided with the regular number of phalanges, and encased in an asymmetrical hoof, the asymmetry of which was such that the presence of another of the same shape internally to it would have formed a symmetrical pair like

the cleft hoof of a ruminant. The metatarsals of the fourth toe on each hind foot were, by the law of correlation, similarly affected; but the supernumerary hoofs of these were stouter and more irregular in shape. The monstrosity appeared to present an interesting reversion in the direction of the extinct and fossil *Hipparion*.

ONE of the "A B C Despatch-boxes," patented by Jenner and Knewstubb, has been forwarded to us. We hail it as a most useful invention for all who have papers to keep in order—a condition which largely obtains in the case of scientific men, and we commend it accordingly.

ON the night of the 26th January some severe shocks of earthquake were felt at Accra on the West Coast of Africa. As three series had been felt in five months there was considerable alarm.

MR. HYDE CLARK will bring before the Anthropological Institute on Monday the result of his researches on the ancient history of civilisation, and the development of comparative mythology in Western Asia and Europe, previous to the Aryan period.

COAL has been found at Sarawak in a district easy of access, and where native labour is easily obtainable.

INDIAN papers, in reporting an earthquake shock in Assam on January 27th, give two native theories of the causes and origin of earthquakes. The one is that when the world becomes sinful, a kind of large serpent, on which the world rests, turns on its side, and so causes them. The other is, that earthquakes are caused by periodical leaps of the mountain gods from one mountain to another.

THE Folkestone Natural History Society has issued its third annual report, from which we gather that its progress is still satisfactory. The number of members now reaches 150, showing an increase of thirty-two during the past year. The attendance both on field days and at the *conversazioni* has been, on the whole, very good. The expenses attendant on the reorganisation of the museum have been somewhat heavy, and an appeal is made for the formation of a museum fund, which it is hoped will meet with a suitable response. The report contains a selection from the papers read during the year, those published being: "On Primroses and their Fertilisation," by the secretary, Mr. Ullyett; "On Arctic Botany," by the president, Dr. Fitzgerald, who accompanied Lord Dufferin on his voyage to the North Pole some few years since; "On the Special Characteristics of Seaside Plants," "On the Yeast Plant," and "Local Botany." We are somewhat disappointed that more prominence is not given to local natural history; but, with this exception, the report is very creditable, although a little more attention might have been advantageously bestowed upon the printing of the scientific names. A list of the books given and lent to the library concludes the report.

DR. FAYRER, in India, has been experimenting to correct the popular error that a snake cannot kill a snake. He took a young and very lively cobra fourteen inches long, and which was bitten in the muscular part of the body by a krait forty-eight inches long. The krait had not bitten for some days before. From a detailed report by Dr. Fayrer, it appears that the cobra was bitten at 12.50 P.M., at 1 P.M. it was very sluggish, at 1.3 P.M. so sluggish that it moved with difficulty, could be easily handled, and made no effort at resistance. At 1.20 it was apparently dying and its movements were scarcely perceptible, and at 1.22 it died, thirty-two minutes after the attack. Dr. Fayrer has found that the water-snakes of India are deadly poisonous. In the Bay of Bengal they swarm, and it is noted as ominous that lately it was proposed to erect a sea bathing establishment for

Calcutta at Parwar, under the assurance there were no sharks. It is remarked that sharks need not be noticed when a bather may have deadly water-snakes swimming after him.

THE *Correspondenzblatt* of the Naturalists' Society of Riga, 1870, contains an abstract of a paper by Herr Teich, "On the influence of climate on the size, colour, form, and number of species of butterflies."—An account of a discovery by Prof. Nauch that thin glass tubes when they have a ball blown at their ends give out a distinctly audible and clear note on cooling so long as the relation of the size of the ball to the length of the tube does not pass a certain limit. The sound is ascribed to vibrations set up by the inrush of air consequent upon cooling. Some remarks by the same professor on a lightning tube found at Ilgezeem:—A long paper on cell life by C. A. Hengel:—A communication from Herr Thieme to the effect that he has found that *Dracena paniculata* kills flies, particularly when the plant stands several feet from the window. The dead flies hang to the under side of the leaf:—A paper by A. Nöschel on the Trevelyan instrument, the sound produced by which he considers due to friction between the two metals—the one contracting, whilst the other expands, the vibratory movement being considered as secondary. The author calls attention to the fact that when the instrument has been in action for some time a bright spot is formed on the metal at the point of contact, which he considers as evidence in favour of his theory. Baron Horyingen Huene gives an account of a plan of sugaring for insects with apples cut in three soaked in solution of honey for a day, then strung on string, and suspended between adjacent trees, which he has found very successful. The journal contains many other communications, but without much original matter in them.

A REPORT comes from Bangalore in the Madras presidency, that coal and paying gold have been found.

AN Australian is said to have raised a sum of money by a false representation of the existence of coal at Midnapore in Bengal.

A SLIGHT shock of earthquake was felt at Guayaquil in Ecuador on the 9th January. The movement was from the interior towards the coast.

AN eruption of the Colorucco volcano in Mexico in January has done much damage to plantations and villages. An eruption of Mount Orizaba is expected.

ON the night of the 31st January an earthquake was felt at Bombay, which extended over a large tract of country. It is stated that on New Year's Day Northern Guzerat had a like visitation.

BESIDES the objects brought from the Guano Islands of Guanape, on the coast of Peru, by Mr. Josiah Harris, and exhibited at the Ethnological Society last year, we have now the report of a large find. The most interesting objects are rude representations of the human figure, cut in very hard wood. On the north island, beneath forty feet of guano, a cavity was come upon, which, on the removal of the guano, was found to be a cave, leading downwards further forty feet. This was a kind of Pompeii, but blocked with bird dung instead of volcanic ashes. It had been evidently frequented by man, and contained many handwrought works, and also well-preserved seafowl and other birds, lizards' eggs, but all petrified, as it were, in the guano. In many cases the colour of the eggs is preserved. The cracks and fissures in the walls of the cave were found filled with solidified ammoniacal salt. Two pieces of earthenware vases were found, bearing figures, also two gold earrings, and a bundle of medicinal herbs tied up in woven cloth. Local antiquaries consider the objects as far older than the time of the Spanish conquest. The point of interest is the accumulation of guano above the surface.

WE learn from the *British Medical Journal* that Dr. Crace Calvert, of Manchester, having been requested to carbolicise a quantity of charpie for the use of the ambulances at the seat of war, found that charpie was unsuitable for the purpose; and after trying several textures, finally hit upon oakum as the most excellent. The oakum is first soaked in Burgundy pitch, and then rendered antiseptic by the addition of carbolic acid. This application has been a good deal used at the Manchester Infirmary, and with good results.

A NEW undertaking of interest to the philosopher is the Arequipa Railway in Peru just opened for traffic. It is a great engineering work, carried out with English capital by American enterprise, and it penetrates the western chain of the Cordillera of the Andes to reach the table lands of the interior, Arequipa, the terminus, being 7,800 feet above the level of the sea. Now at this elevation the rarefaction of the air is such that the ordinary workmen could not be employed, the suffering being in some cases intense. The works were, however, pushed on with vigour, and Mr. Meiggs imported above 16,000 labourers for his works, and for this purpose chiefly Aymara Indians from Bolivia. Mr. David Forbes, F.R.S., has, in his memoirs on the Aymaras in the *Journal of the Ethnological Society*, described the abnormal structure of the chests of these people, and it is astonishing to see them employed in a task which most effectually insures their subjugation. To foreign troops it was always difficult to scale these regions, but now the railway does the work, though to soldiers and passengers the journey is not always without discomfort.

THE Bunya-Bunya (*Araucaria Bidwilli*), a native of the northern district of New South Wales, is of considerable interest, as being the only hereditary personal property possessed by the natives, who greedily devour the fruit, either raw, or roasted and made into cakes. This fruit is only plentiful every third year; and at the proper season the aborigines assemble in considerable numbers for the purpose of obtaining it. Each tribe has its own set of trees, and each family its particular individuals among them; and these are handed down from generation to generation. The right of ownership is almost universally respected; but occasional depredations occur, when a fight ensues, the sympathies of the bystanders going with the lawful proprietor.

WE learn from the *Grocer* that experiments recently carried on in India have proved that coffee pulp will yield, upon distillation, 9 per cent. of its own weight of spirit, equal in strength to Scotch whisky. Nothing is said as to the flavour of this spirit in its raw state, but it appears to realise on the spot a price nearly equivalent to 4s. 6d. per gallon.

AT the end of January, no date named, a shock of earthquake was felt in the Sanjak of Kartal, in Northern Asia Minor, which lasted several seconds and did slight damage.

A LARGE and valuable deposit of limestone has been discovered by Mr. Read in the Sonthal Pergunnas, in Bengal, in the Banslo River. There is good communication with Calcutta by water or railway.

SOME fair pearls have been brought down to Durban, in Natal, from the River Vaal. They were found in mussels.

NATURAL history and dancing and the Police. Such is our announcement from Madras. In consequence of a fatal case the Commissioner of Police has ordered that the dancing girls shall not dance in the Hindu temples with cobra snakes thrown round their necks. This will cause great disappointment to the pious votary and the interested amateur. It will tend, however, to lessen the reverence for the cobra, and may bring his tribe into greater danger of repression.

## IMAGINATION IN SCIENCE

PROFESSOR Tyndall will eventually have much to answer for. He has lent his authority to the admission of imagination in the pursuit of science, and there is every prospect that people whose imaginative faculty is stronger than their habit of observation will give us all plenty to do. We shall not only have to question nature, but we shall have to eliminate imagination, and thus have two battles to fight for truth. Our medical friends have not always walked in the ways of rigid observation and induction, but if any one desires to see how easy it is for the imaginative faculty alone to tell us all we require to know, we commend to his perusal the *Mobile Daily Register*, of Dec. 18th, 1870, in which there is a communication from Dr. Cochrane on the subject of yellow fever, well written, and interesting, and giving what may be called an account of yellow fever from the imaginative side. The author justifies his position by the example of European names, tells us candidly that he states only "what he believes but does not know," and then takes his flight into the unknown. He imagines "the yellow fever poison to be composed of living germs in innumerable number, living organisms of inconceivable minuteness, which eat, and drink, and multiply their generations under the sun, just as other living creatures do with which we happen to be familiar." He connects his speculations in these matters with similar speculations about "contagia" and disease "germs" which are well known on this side of the Atlantic, and without paying any attention to facts regarding yellow fever and other diseases which are left untouched by any extant doctrine, he tells us truly that "the visions of modern science are more wonderful than the visions of Eastern fable." This may be true, and the visions themselves may be true; but, for people who feel that they must walk over the earth in search of truth, nutriment of this kind is by no means sufficient for mental sustenance.

We have no desire to undervalue the importance of the imaginative faculty in scientific pursuits; but papers such as the one before us raise some very important primary questions. Are we to live, scientifically, in the same way as alchemists and astrologers did in the Middle Ages? and are we to ignore all that Bacon and Newton have done for us? If it be true that there is no royal road to knowledge on the firm earth, it is certain there is no such road through the air. Let us use the imaginative faculty by all means; but, in doing so, let us take our stand on the firm ground of the known before we venture ourselves into the unknown.

## THE ROYAL SOCIETY'S SOIRÉE

WE are indebted for the following account of the most interesting objects exhibited at the Royal Society's *soirée* on Saturday evening last to the *Standard*, from which paper it is abridged.

In the foremost ranks of notable attractions were the heliotype process of printing photographic plates for plates for book illustration, by Messrs. Edwards and Kidd; the solar eclipse photographs, and the twelve-inch equatorial telescope, with its photographic feed apparatus (Mr. Browning's), by which they were obtained by Lord Lindsay; the musical vibration figures shown in Mr. Spottiswoode's new apparatus; the electrical experiments of Mr. Varley; Commander Harvey's sea torpedo (made by Vavasseur); Dr. Norris's soap-bubble experiments; Mr. Haviland's fine maps of the geographical distribution of cancer and heart disease (very recently published by Mr. Keith Johnston); the gold-hardening process, by Mr. Roberts of the Mint; and Mr. Francis Galton's pantograph and resultant plates for the publications of the Meteorological Office.

The soap-bubble experiments, performed with great adeptness by Dr. Norris, were intended to illustrate the physical principles concerned in the formation of rouleaux in the blood and in the passage of the corpuscles *de toute pièce* through the walls of the minute blood-vessels, without rupture of the latter, as observed by Waller in 1846 and Cohnheim in 1867. A film of soap solution was taken by a metal ring of a foot or more in diameter,